

REMARKS

1. ALLOWABLE SUBJECT MATTER

Applicants gratefully acknowledge Examiner's finding of allowable subject matter in claims 11, 12, and 15. At this time, Applicants wish to forego amending these claims in independent form pending the Examiner's reconsideration of the rejected claims in light of the remarks set forth below.

2. REQUEST FOR RECONSIDERATION

The Examiner rejected claims 1-10, 13-14 and 16 under 35 U.S.C. 103(a) as being unpatentable under U.S. Patent No. 5,708,7432, DeAndrea et al. in view of U.S. Patent No. 5,367,530, Noishiki et al. Specifically, the Examiner found that DeAndrea disclosed all the elements of the claimed invention except for a lead-frame mounted OED receiving cavity. The Examiner added, however, that "Noishiki describes an OED (9,14) having a leave-frame (7,8) positioned in a manner that aligns the OED to an axis (see Figure 3-5 in columns 5-6)." The Examiner concluded that "at the time of the invention, it would have been obvious to one of ordinary skill in the art to use the OED and leave-frame described in Noishiki in the module described by DeAndrea et al." "The motivation for doing so," the Examiner claims, "would be to mount the OED, as suggested by DeAndrea et al at column 5, lines 12-46, to decrease parasitic inductance and capacitance."

In reply, Applicants submit that the combination of references cited by the Examiner fails to suggest the claimed invention.

Claimed Invention

The present invention provides for an opto-electric module that has an optical subassembly that facilitates testing of all of the critical optical alignments and OEDs early in the assembly process before a significant investment of assembly time and materials is made. More specifically, the opto-electric module of the present invention has an optical subassembly which defines the optical path from a fiber in a ferrule to an

OED in a unitary, integrally-molded optical block. The integrally-molded optical block also comprises a ferrule-receiving bore at one end of the optical path for holding the ferrule such that the fiber is aligned with the optical path, and a OED-receiving cavity at the other end of the optical path for holding a lead frame such that the OED thereon is substantially aligned or readily alignable with the optical path. This way, a testable optical subassembly, in which all critical optical alignments are fixed, is formed early in the assembly process by simply combining the unitary, integrally-molded optical block with an OED. This has considerable advantages over the prior art designs which require the assembly of multiple components which are typically expensive and difficult to handle. Therefore, it is an advantage of the testable optical subassembly of the present invention that, if a faulty optical subassembly is detected, remedial action can be performed without extensive disassembly or subassembly can be scrapped with a minimum investment of time and materials.

There is no motivation to modify the optical block disclosed in DeAndrea to receive lead frame-mounted OEDs since this would not likely improve the parasitic capacitance and inductance as suggested by the Examiner.

Applicants submit that one would not be motivated to modify the optical block disclosed in DeAndrea to receive an OED mounted on a lead frame as described in Noishiki "to decrease parasitic capacitances and inductance" as suggested by the Examiner. *To the contrary*, OEDs mounted on lead frames onto a printed circuit board would increase the number of intermediate connections between the OEDs and the components on the printed circuit board and, therefore, would not likely decrease parasitic capacitance and inductance. It is well established in U.S. patent law that there can be no motivation to modify a reference if that modification would destroy or otherwise undermine the object of the invention of the reference. Here, DeAndrea states as follows:

Applicants have recognized that [certain OED] devices possess a relatively high degree of parasitic inductance, capacitance and resistance as a result of the *numerous solder indoor wire-bonded connections between the OED and the printed circuit board*. ...

Column 1, line 61 through Column 2, line 13 (emphasis added). DeAndrea states further as follows:

By surface mounting the OED 30 to substrate 15, it can be appreciated that certain of the required electrical connections between the OED and the substrate can be made through contact pads or the like on the surface (17) of the substrate, as is well-known. It will be appreciated by those in the art that such means for providing electrical connections produce a suitable decrease in the level of parasitic capacitance and inductance as compared to prior art electrical connections, as shown in Fig 1 *Furthermore, mounting of the OED 30 onto the substrate 15 enables the distance between the device and the associated circuit elements to be minimized. This further reduces the parasitic capacitance and inductance associated with the present connectors.*

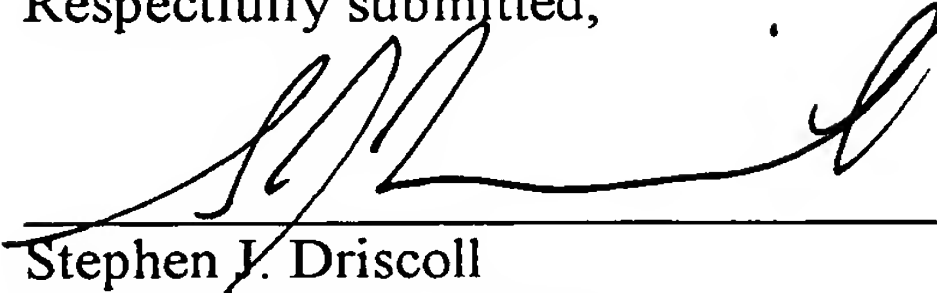
Column 5, lines 29-46 (emphasis added). Therefore, it is clear from DeAndrea that minimizing the distance and the number of connections between the OED and the other components on the printed circuit board is important to reducing the parasitic inductance and capacitance.

Mounting the OED to a lead-frame and *then* mounting this assembly to the printed circuit board necessarily increases the distance and number of intermediate connections between the OED and the other components on the circuit board. This is in direct contrast to an object of DeAndrea which is to mount the OED directly on the substrate to enable the distance between the device and its associated circuit elements to be minimized.

Although the applicants do not necessarily believe the use of lead frames would diminish the electrical performance of the opto-electric module, it is clear from DeAndrea that intermediate connections between the OED and the circuit board are not favored. Therefore, contrary to the Examiner's suggestion, there would not be motivation to modify the module of DeAndrea to include an OED mounted on a lead frame as taught by Noishiki. Accordingly, the applicants respectfully request the rejection be withdrawn and the claims be allowed.

An early and favorable response is earnestly solicited. Thank you.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'SJD', is written over a horizontal line.

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